

May 12, 2021

EPA Comments on the Revised *Appendix X Fiscal Year 2021 Fish Tissue Sampling in Bear Creek in Support of the EPA Administrator's Dispute Resolution Decision for Radiological Discharge Limits (DOE/OR/01-2457&D4) Erratum FY21-BCV-01*

General Comments

A. This appendix is part of a Corrective Management Plan (CMP) for the Bear Creek Valley Watershed. The CMP manages environmental media monitoring which includes monitoring of groundwater, surface water, and biological media (e.g., fish, biota surveys, etc.) for both performance and baseline data assessments of trends, regulatory compliance, future actions, and in support of the CERCLA Five-Year Review of remedy protectiveness. A key component missing from this sampling plan is the need to acknowledge that beaver dams create changes to the dynamics of the fish ecosystem along Bear Creek. These features can change the fish population and likely increase the radiological body load for fish as they grow behind such features downstream of radiological source areas. This sampling plan should reference the problem with beaver dams and report how beaver control measures will be documented in the Bear Creek CMP. This issue is relevant due to the resampling of Bear Creek scheduled for the Fall of 2021 and the use this appendix as the means to document radiological contamination in future fish sampling events.

B. Several statements made in Section 2 and subsection 3.1.2 (page 11, first paragraph) regarding the fish habitat and availability in Bear Creek need cited references. It is also important that references be provided to support statements made in regard to the migration and behavioral patterns of sunfish, the catchable and edible fish population density in Bear Creek, the percent consumption of whole fish versus fillet, and compositing of multiple fish species for consumption by recreational fishers. Recreational fishers who eat rock bass may not eat sunfish and vice versa. Some of the information presented in subsection 3.1.2 should be reworded for clarity.

C. Fish sampling for radionuclides will reoccur in the Fall of 2021. Please add this event to the appropriate sections of the SAP and indicate that this SAP (perhaps with some modification) will be used to direct those activities.

D. The word spacing varies in places throughout the document where one sentence ends with a period and another begins. Please check because some sentences begin with a single space, some double, and a few have three spaces. Please make spacing consistent throughout the document.

E. It remains unclear how the Spring and Fall fish population events will be extrapolated to fish consumption rates. This SAP should reference the need for the risk assessors from the three parties (plus UCOR) to discuss how site-specific fish consumption will be developed.

F. All parties recognize that the method used to translate radiological instream water quality levels to radionuclide-specific effluent discharge limits has not been clearly developed. This

issue remains subject to further discussion and agreement. This needs to be clearly stated in the revised SAP.

Specific Comments

1. The Appendix X page (no page number) has a typo with discharge that should be changed to discharge.
2. Acronyms, p. ix – Add EIT (mentioned on page 21) to the list of acronyms
3. Editorial, page 1.
 - Current text: Fishing is expected to be limited because edible, catchable game fish are typically small, conservatively around 30 g (1 oz), yielding 10 g of fillet. Eighteen fish must be caught and combined to obtain a 180 g (6 oz) meal.
 - Suggested revision: Fishing is expected to be limited because edible, catchable game fish are typically small, conservatively around 30 g (1 oz), yielding 10 g of fillet. Depending on the size of the fish, several fish would have to be caught and combined to form and 180 g (6 oz) meal. (For example, 18 1 oz fish must be caught and combined to obtain a 180 g (6 oz) meal.
4. Section 1 “Introduction” (p. 1) – In describing the purpose of the fish sampling and analysis activities, this section states, “... radionuclides that would adversely affect recreational fishermen.” It is suggested that the word would be changed to could since risk is estimated.
5. Section 2 “Background” – The following comments pertain to this section:
 - This section states, “Sampling has indicated that the discharged water typically contains low levels of radionuclides.” The term *low* is subjective and should be clarified (and qualified) by describing the comparison of the wastewater results to the appropriate discharge limits or some other applicable criteria.
 - The following sentence is awkward and should be reworded: “*Fishing is not allowed on the ORR, including no fishing is allowed along Bear Creek Road.*” For clarity, it is suggested that the words “is allowed” be removed. Further, if signage is posted along Bear Creek Road, please add language stating so.
 - This section states on page 2, “*Although there is no evidence on the ORR, a very small percent of fishers in larger fisheries do consume whole fish.*” It then states, “... *sunfish are usually resident to a given location.*” Please provide references for these statements. Note that there are literature-based studies available on the migratory patterns of sunfish in watersheds and the data indicates that sunfish migration patterns and behavior are seasonal and reflect the tracking of planktonic prey distributions (i.e., sunfish migrate to the location of their food prey items).

6. Editorial, page 2. The current fish tissue data does not determine the discharge limits, but may be used to adjust discharge limits so that the overall risk to fish consumers does not exceed 10^{-5} .

The statement: "These data will be used to define the human health risk from fish consumption from these sites to determine the safe levels that radionuclides can be discharged from the EMWMF and proposed EMDF." Should be revised to: "These data will be used to define the current human health risk from fish consumption from these sites, and will be considered in determining the appropriate discharge limits for radionuclides from the EMWMF and proposed EMDF."

7. Figure 1, p. 2 – Although Figure 1 is titled "Location of Bear Creek on the ORR," the geographical location of Bear Creek is not depicted. Since Bear Creek is the primary focus for the fish sampling effort, it is pertinent to pinpoint Bear Creek on this figure in lieu of Bear Creek Road which does not parallel Bear Creek in its entirety.

8. Section 3.1.1 "Sample Locations", p. 3 – The following comments pertain to this section.

- o It states, "Figures 2 and 3 show sample locations and historical past biota sampling locations." For clarity and accuracy, it should be mentioned that the biota sampling activities previously conducted at these locations were for non-radionuclides and there are no existing radiological data.
- o The second paragraph should state that the reference stream (Brushy Fork Creek) is upstream of the EMWMF and presumably unimpacted from EMWMF-related radionuclides.
- o The last paragraph mentions the two stream reaches, BCK 7.0 – 9.9 and BCK 11.9 - 12.4, for assessing baseline conditions of radiological contaminants of concern (COCs) in Bear Creek. The reference to "BCK 9.9" should be removed from this sentence and referred to only as BCK 7.0 – 9.9.

9. Section 3.1.1 Sample Locations, second paragraph, last sentence p. 3: Remove second period from end of sentence.

10. Section 3.1.1 Sample Locations, third paragraph, p. 3: Remove extra space between "POEs" and "at" -- "the POEs at BCK 9.9."

11. Editorial, p. 3. The last two paragraphs in Section 3.1.2 belong in Section 3.1.3.

12. Section 3.1.2 "Fish Population Surveys", p. 3 – The following comments pertain to this section.

- o This section states, "In addition, fish population surveys will be conducted at the additional evaluation points BCK 9.9 and 12.4. Please provide the full stream reaches in lieu of individual sampling points since these surveys are expected to be performed over approximately 80 to 100 meters.
- o On page 11, the first paragraph mentions a fish size requirement of approximately 60 grams of fish fillets as being necessary to perform the radionuclide analyses then the size requirement changes to 40 to 60 grams.

Since one duplicate per 8-10 samples would be collected, it is recommended that the size requirement be consistently established at 40 to 60 grams per fish tissue sample. In addition, the following sentence is unclear and should be omitted or reworded for clarity: *“As further described in Sect. 3.1.3, larger fish are preferred, of sufficient size for one sample from each fish.”*

- The SAP mentions that it is appropriate to combine composite results from small fish with discrete sample results from larger fish (i.e., bass) when computing statistics because it was assumed that people who consume fish typically combine all types of fish in their meals. While it is acceptable to evaluate a scenario where a recreational fisher may consume both sunfish and bass, additional fish consumption scenarios should be evaluated to account for those recreational fishers that consume either bass or sunfish only. It is recognized that the decision on how to composite the samples at each POE will be made by the project team based on the size, type, and number of fish collected. However, once a decision is made, the fish tissue sample results should be presented and assessed separately for different fish species (i.e., rock bass versus sunfish) to account for these additional fish ingestion scenarios. Fish tissue samples should also include the skin and muscle tissue (after scaling and removal of gullet and fins) and the composite tissue samples should be collected per fish species per POE location and combined prior to homogenization.

13. Section 3.1.3 Fish Tissue Sampling, p. 6: Two sentences highlighted in yellow on the clean copy provided indicate a decision will be made. The first does not reference the decision maker(s) while the second references the “project team.” Should they be the same decision maker? Please correct text to clarify the decision makers for both decisions.

14. Section 3.1.3 “Fish Tissue Sampling,” p. 6 – The following sentence is unclear and should be omitted or reworded for clarity: *“As further described in Sect. 3.1.3, larger fish are preferred, of sufficient size for one sample from each fish.”* In addition, please reword the following sentence for clarity: *“If sufficient larger fish are not present at a given location, then enough mass for fish tissue sampling can be difficult to collect at some locations and seasons.”*

15. Section 3.1.5 Future Bear Creek Characterization Project, p. 7: A Fall fish sampling event should be mentioned in this section. The text should explain that the radiological fish assessment leading to the establishment of a fisher-protective radionuclide discharge effluent level will move forward with the Spring fish sampling/analysis event. The Fall fish sampling will provide necessary confirmation and if it changes the radiological discharge effluent limit, then that would be addressed in an EMDF post-ROD modification.

EPA Comment: Because this SAP will serve as the basis for future Bear Creek radiological fish collection and analysis (e.g., Fall 2021) the issue with beaver dam management should be identified and explained in this section.

16. Page 11. The text states “While present, fish smaller than 30 g are typically not consumed by a recreational fisher and will not be included in the sample volume.” This statement should be

qualified. Fish smaller than 30 g may be used at the BCK 7.0 – 9.9 and BCK 11.9 - 12.4 reaches. Further, the text in 3.1.3 says that “If insufficient sample volume is collected at any location, then smaller fish (less than 30 g) will be filleted and those fillets included in the composite sample.” The first statement should be omitted or revised.

17. Section 3.2 “Methods”, p. 14 – the text states, “... includes the sampling procedures and analytical methods used for this one-time sampling and analysis plan.” It is unnecessary to describe the SAP as “one-time.” Please omit “one-time” from this sentence as the future characterization of Bear Creek (e.g., Fall 2021) is already captured in subsection 3.1.5. In addition, the last stand-alone sentence on this page regarding wet weight fish tissue analysis should be inserted at the end of the first paragraph as it does not warrant its own paragraph.

18. Section 5. ADDITIONAL COCS CONSIDERED, Cesium-135, second paragraph, p. 18: Please remove extra space between “3) risk...”

19. Section 5. ADDITIONAL COCS CONSIDERED, Polonium-210, first paragraph, p. 18: There is a reference to “(see Fig x)” which on the next page is “Fig. 4. Uranium decay chain.” Is this the correct figure? Please correct text and/or add a new figure and correct text.

20. Section 6. SUMMARY, first paragraph, first sentence, p. 20: The sentence references “...the EPA Administrator’s Dispute Resolution Agreement...” This phrase should be changed to “the EPA Administrator’s Dispute Resolution Decision...”

21. Section 6. SUMMARY, first paragraph, second sentence, p. 20: The text uses the word “were” in two locations. Please change the second “were” to “are” for greater clarity.

22. Section 6. SUMMARY, fourth paragraph, p. 20: The text states:
“As a future project, additional fish, water, and sediment (as appropriate) may be collected through Bear Creek to determine the levels and types of contamination present at different locations. This characterization may be repeated at some frequency to be agreed upon later as part of the BCV CMP or other primary document. A separate DQO session will be held to determine the objectives and approach for this sampling program”

EPA Comment: Please add a period to the end of the last sentence quoted above. See comment number 15 above. Reference should be made to the Fall 2021 fish sampling event. Additionally, this paragraph highlights the need to discuss in summation the management of beaver dams along Bear Creek which could enhance the bioaccumulation of radionuclides in fish possibly to unacceptable levels. Because this SAP will likely serve as the basis for future radiological fish sampling, the issue of beaver dam management must be addressed.

(End of Comments)